



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,782	06/11/2003	Paul Silinger	H0002233 US - 4018/H9925-	2472
128 7590 06/16/2009 HONEYWELL INTERNATIONAL INC. PATENT SERVICES 101 COLUMBIA ROAD P O BOX 2245 MORRISTOWN, NJ 07962-2245				
EXAMINER				
VAN, LUAN V				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
06/16/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/765,782

**Applicant(s)**

SILINGER ET AL.

**Examiner**

LUAN V. VAN

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 May 2009.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 8-13 and 19 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-3, 8-13, and 19 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's amendment of May 11, 2009 does not render the application allowable. Claims 1-3, 8-13, and 19 are pending in the application.

### ***Status of Objections and Rejections***

All rejections from the previous office action are maintained.

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 8-13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akino et al. in view of Wong (US patent 4879007) and Andricacos et al. (US patent 5516412).

Regarding claim 1, Akino et al. teaches a plating system comprising: an elongated upper channel formed by a plurality of upper shields 4 (Fig. 1) and an elongated lower channel formed by a plurality of lower shields 5, wherein each channel is separated by a gap between the upper and lower shields, and wherein the shortest distance from the part being plated to a channel wall is less than the shortest distance between the channel wall and an anode (as seen in Fig. 1); and the plating solution horizontal sparger 7 oriented to direct any plating solution flowing through the inlet directly into one and towards another of the upper and lower channels.

Akino et al. differs from the instant claims in that the reference teaches a single inlet but does not explicitly teach whether there is a series of them. Akino et al. is also silent to whether the gap is less than the height of the part being plated.

Andricacos et al. teaches a series of inlets in an electroplating chamber for uniformly discharging the electrolyte vertically upwardly into the plating chamber (column 6 line 47 -- column 7 line 20).

Wong teaches a shield for an electroplating bath comprising a shield having walls that overlap the edges of the part being plated. This overlapping distance can be within the range of 2-10 cm (column 3 lines 37-42).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Akino et al. by using the series of inlets of Andricacos et al., because the series of inlet would enable the plating solution to be uniformly discharged into the plating chamber (column 6 lines 47-55 of Andricacos et al.). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have further used the shield such that it overlaps the edge of the part to be plated, as taught by Wong, in the apparatus of Akino et al., because it would deposit a uniform thickness coating on the substrate (column 2 lines 49-53 of Wong). By using the upper and lower shields of Akino et al. such that it overlaps the edges of the substrate, as taught by Wong, the gap would be less than a height of the substrate.

Regarding claim 2, Akino et al. teaches the system of further comprising: an anode 2; and a substantially planar cathode 3 comprising a first conductive surface, a second conductive surface, and a perimeter edge, the first conductive surface and

second conductive surface being substantially parallel to each other and positioned on opposite sides of the cathode; wherein the sparger 7 is positioned at least as close to the perimeter edge of the cathode as to either of the first or second conducting surface (see Fig. 1).

Regarding claim 3, the sparger of Akino et al. directs the plating solution towards the cathode in a plane substantially coplanar with the cathode.

Regarding claims 8, 10, and 11, Akino et al. differs from the instant claims in that the reference does not explicitly teach the width of the channels. However, Wong teaches that it is necessary to provide a shield of the correct dimension for each particular substrate in order to give the desired shielding effect (column 5 lines 7-10). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have optimized the shield dimension as taught by Wong and apparatus of Akino et al. in order to provide the desired shielding effect (column 5 line 7-10 of Wong). Further in addressing claim 11, Wong teaches holding clamps 39 (Fig. 11) for holding the substrate.

Regarding claim 9, Akino et al. teaches wherein the horizontal sparger directs any plating solution flowing through the inlets into the lower channel and towards the upper channel (Fig. 1).

Regarding claim 12, Akino et al. teaches a plurality of anodes 2 (Fig. 1).

Regarding claim 13, Akino et al. teaches the upper channel and lower channel are separated by a distance. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Akino et al.

by varying the distance, because it would allow substrates of different sizes to be uniformly electroplated.

Regarding claim 19, Wong teaches a shield for an electroplating bath comprising a shield having walls that overlap the edges of the part being plated. This overlapping distance can be modified within the range of 2-10 cm (column 3 lines 37-42). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have further optimized the overlapping distance (i.e., gap distance) as suggested by Wong in the apparatus of Akino et al. in order to deposit a uniform thickness coating on the substrate (column 2 lines 49-53 of Wong).

Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akino et al. in view of Wong, Andricacos et al., and further in view of Grigger (US patent to a 59166).

Regarding claim 4, Akino et al., Wong and Andricacos et al. teach the apparatus as described above. In addition, Akino et al. teaches each of the upper and lower channels comprises two substantially planar and parallel sides that are substantially parallel to the cathode; and the cathode is positioned at least partially within each of the upper and lower channels between the sides (see Fig. 1).

Akino et al. differs from the instant claims in that the reference does not explicitly teach whether the shields are non-electrically conductive (claim 4).

Grigger teaches a shield structure that may be fabricated of any suitable non-conducting material which is inert to chemical action of the plating bath (column 2 lines 40-43).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the shield of Akino et al. with the nonconducting shield of Grigger, because a nonconducting shield would be inert to chemical action of the plating bath (column 2 lines 40-43 of Grigger).

Regarding claim 5, Akino et al. teaches the upper and lower channels are positioned opposite each other and are separated from each other, the separation between the channels forming a pair of solution egress slots (see Fig. 1); and the channels are adapted to prevent current from flow between the anode and cathode other than through the egress slots (see Fig. 1).

Regarding claim 6, Akino et al. teacheses the egress slots are positioned approximately parallel to a center line of the cathode (see Fig. 1).

Regarding claim 7, the instant claim is directed to a material or article worked upon. "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, "[i]nclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." *In re Young*, 75 F.2d 996, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)). MPEP 2115.

The apparatus of Akino et al. is structurally capable of plating a cathode comprising a dielectric substrate and conductive surfaces.

### ***Response to Arguments***

Applicant's arguments filed have been fully considered but they are not persuasive. In the arguments presented on page 7 of the amendment, the applicant argues that Wong does not teach upper shielding plates and lower shielding plates and therefore would not be combinable with Akino et al. This argument is deemed to be unpersuasive, because Akino et al. already teaches the upper shielding plates and lower shielding plates, therefore Wong is not required to teach the same features. Wong is merely relied upon to teach that it is known to use a shield that overlaps the edges of a substrate in order to deposit a uniform thickness coating on the substrate. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the shields of Akino et al. such that it overlaps the edges of the substrate, as taught by Wong, because it would deposit a uniform thickness coating on the substrate (column 2 lines 49-53 of Wong). In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only



from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

The applicant further argues that Andricacos et al. also does not teach the upper shielding plates and lower shielding plates and therefore would not be combinable with Akino et al. As stated above, since Akino et al. already teaches the upper shielding plates and lower shielding plates, Andricacos et al. is not required to teach the same features. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, since Akino et al. and Andricacos et al. are both directed to an electroplating apparatus and the apparatus in both references require a solution inlet, it would have been obvious one having ordinary skill in the art to modify the plating solution inlet of Akino et al. with that of Andricacos et al. because it would uniformly discharge the plating solution, as taught by Andricacos et al. (column 6 line 47 -- column 7 line 20).

The examiner believes that he has met the requirement for a prima facie case of obviousness.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUAN V. VAN whose telephone number is (571)272-8521. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/  
Supervisory Patent Examiner, Art Unit 1753

LVV  
June 11, 2009